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| Exhibit R-2, RDT&E Budget Item Justification | | | | | Date: February 1999 | | | | |
| APPROPRIATION/BUDGET ACTIVITY | | | | | R-1 ITEM NOMENCLATURE Cooperative Engagement Capability | | | | |
| RDT&E/4 | | | | | Program Element (PE) Name and No. 0603658N | | | | |

| COST (\$ in Millions) | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | Cost to Complete | Total Cost |
|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|------------------|------------|
| Total P.E. Cost | 200.512 | 195.462 | 114.931 | 98.203 | 50.655 | 49.485 | 47.604 | 47.790 | CONT. | CONT. |
| CEC/K2039/U2039 | 200.512 | 118.640 | 114.931 | 98.203 | 50.655 | 49.485 | 47.604 | 47.790 | CONT. | CONT. |
| CEC/K2616 | 0 | 76.822 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Quantity of RDT&E Articles & cost | | | | | | | | | | |

A. (U) Mission Description and Budget Item Justification: Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture having fire control quality. CEC distributes sensor data from each ship and aircraft, or cooperating unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC will significantly improve our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC will provide critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

(U) CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and Combat System Modifications. The DDS encodes and distributes ownership sensor and engagement data, is a high capacity, jam resistant, directive system providing a precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor which is able to process force levels of data in a timely manner that allows its output to be considered real-time fire control data. This data is passed to the ship's combat system as fire control quality data for which the ship can cue its onboard sensors or use the data to engage targets without actually tracking them.

PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1998 ACCOMPLISHMENTS:

- (U) (\$ 55.736) Continued CEC hardware and software systems engineering efforts at Raytheon Systems Company, St. Petersburg, FL.
- (U) (\$ 26.372) Continued CEC Technical Design Agent/Design Agent (TDA/DA) engineering efforts at the Johns Hopkins University, Applied Physics Laboratory, Laurel, MD (JHU/APL).
- (U) (\$ 36.100) Continued CEC E-2C integration efforts at PMA 231.
- (U) (\$ 15.010) Continued airborne E-2C integration support and completed installation aboard P-3 aircraft.
- (U) (\$ 4.847) Continued Advanced Combat Direction System (ACDS) integration efforts and conducted ACDS Block 1 Certification Testing at Integrated Combat Systems Test Facility, San Diego (ICSTF).
- (U) (\$ 21.824) Continued AEGIS integration efforts; developed and conducted initial at-sea testing of integrated CEC/AEGIS Baseline 6, Phase 1 software.
- (U) (\$ 17.367) Continued field support (In-Service Engineering; Software Support; Integrated Logistics Support Planning).
- (U) (\$ 6.807) Conducted test and evaluation (T&E) efforts (engineering tests; underway periods 1-4 with USS John F. Kennedy battle group).
- (U) (\$ 9.372) Continued Naval and Joint integration efforts (AN/TPS-59 HAWK; Satellites).
- (U) (\$ 7.077) Continued Program Management support.

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| APPROPRIATION/BUDGET ACTIVITY RDT&E/4 | R-1 ITEM NOMENCLATURE Cooperative Engagement Capability Program Element (PE) Name and No. 0603658N | |

(U) FY 1999 PLAN:

- (U) (\$ 74.404) Continue CEC hardware and software systems engineering efforts at Raytheon; commence AN/USG-2 Design Agent transition from JHU/APL.
- (U) (\$ 19.058) Continue CEC TDA/DA engineering efforts at JHU/APL.
- (U) (\$ 37.680) Continue CEC E-2C integration efforts at PMA 231.
- (U) (\$ 8.065) Continue ACDS/CEC integration efforts (test support; correction of interoperability/interface problems).
- (U) (\$ 12.160) Continue field support (In-Service Engineering; Software Support; Integrated Logistics Support Planning).
- (U) (\$ 15.615) Continue T&E efforts; conduct engineering; developmental and operational testing.
- (U) (\$ 14.005) Continue Naval and Joint fleet exercises and integration efforts.
- (U) (\$ 9.866) Continue Program Management support.
- (U) (\$ 4.609) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

(U) FY 2000 PLAN:

- (U) (\$ 34.726) Continue CEC hardware and software systems engineering and DA transition efforts at Raytheon.
- (U) (\$ 17.500) Continue CEC TDA engineering efforts at JHU/APL.
- (U) (\$ 11.600) Continue CEC E-2C integration efforts at PMA 231.
- (U) (\$ 14.800) Continue field support (In-Service Engineering; Software Support; Integrated Logistics Support Planning).
- (U) (\$ 28.800) Conduct T&E efforts (TECHEVAL/OPEVAL Phase 1).
- (U) (\$ 4.653) Continue Naval and Joint fleet exercises and integration efforts.
- (U) (\$ 2.852) Continue Program Management support.

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| RDT&E/4 | Program Element (PE) Name and No. 0603658N | |

B. Program Change Summary:

| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> |
|--|----------------|----------------|----------------|
| FY 1999 President's Budget: | 206.851 | 131.623 | 82.704 |
| Appropriated Value: | 213.229 | 196.123 | |
| Adjustment to FY 1998 Appropriated Value/ FY 1999 President's Budget: | -12.717 | -0.661 | +32.227 |
| FY 2000 PRES Budget Submit: | 200.512 | 195.462 | 114.931 |

Funding: FY 1998 changes are due to a decrease for FY98 SBIR (-5.369), a decrease for Congressional Undistributed Reductions (-6.378), a decrease for minor pricing adjustments (-.710), and a decrease for FY 1998 update (-.260). FY 1999 changes are due to various rate adjustments. FY 2000 changes are due to an increase to adjust CEC program funding (+15.700), an increase to support the revised testing schedule (+28.500), a decrease for LAMPS III Data Link transfer (-10.000), and a decrease for various rate adjustments (-1.973).

Schedule: DT-IIC/OT-IIA2 Operational Assessment of the integrated CEC/E-2C aircraft is scheduled for May 1999. The 2nd Low Rate Initial Production contract award is scheduled for February 1999. DT-IID/OT-IIA3 is scheduled for mid-1999. OPEVAL is planned for 2000. Milestone III is scheduled for July 2001.

Technical: Not applicable.

C. Other Program Funding Summary

| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> | <u>FY 2001</u> | <u>FY 2002</u> | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> | To <u>Complete</u> | Total <u>Cost</u> |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------|----------------------|
| OPN 260600/5/6 | 70.908 | 81.993 | 60.494 | 74.407 | 155.646 | 185.456 | 126.648 | 124.961 | 458.521 | 1.336.034 |
| SCN Various | 21.475 | 14.544 | 23.401 | 21.460 | 31.470 | 47.425 | 20.507 | 20.204 | 31.514 | 232.000 |
| O&MN 1D4D | 17.886 | 20.388 | 22.243 | 24.168 | 25.230 | 25.353 | 25.988 | 26.659 | CONT. | CONT. |
| APN (BA-5,1) 330000 | | | 12.734 | 19.933 | 19.706 | 19.904 | 12.534 | 12.743 | 353.690 | 451.244 |
| R&D(0204152N) | 5.109 | | | | | | | | | 5.109 |
| R&D (U2039)(0603755N) | | | | | | | | | | 836.063 |

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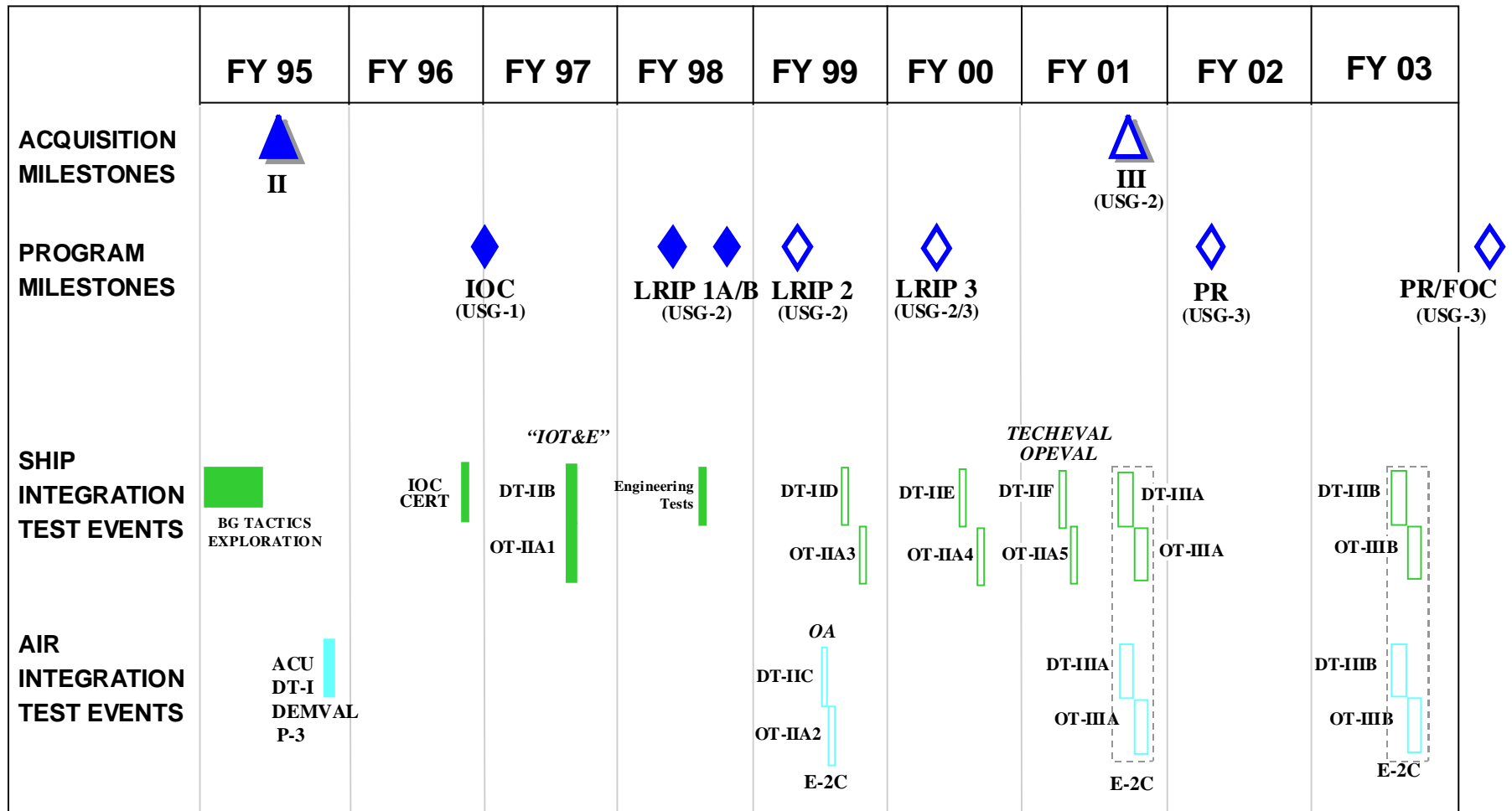
D. Acquisition Strategy: The CEC program received LRIP approval in March 1998 and a sole source contract was issued to Raytheon Systems Company, St. Petersburg, Florida. Follow-on LRIP contracts are planned in the 2nd quarter of FY 1999 and FY 2000. Full Rate Production is planned for FY 2001. Separate contracts will be issued for software maintenance and development and repair of existing CEC equipment. LRIP and software contracts are planned to be cost plus incentive/award fees and the system maintenance contract will be a Basic Ordering Agreement. A competition feasibility analysis will be completed prior to entering full rate production. A Pre-Planned Product Improvement program in 2002 is expected to incorporate technology advancements/increased functional capabilities. The goal will be to decrease Total Ownership Cost and increase Reliability and Maintainability.

E. Schedule Profile (See Next Page)

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Exhibit R-2 RDT&E Budget Item Justification
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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E/4 | PROGRAM ELEMENT NAME AND NUMBER Cooperative Engagement Capability 0603658N | PROJECT NAME AND NUMBER CEC/K2039 |

| | Contract Method & Type | Performing Activity & Location | Total Pys Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | | | Cost To Complete | Total Cost | Target Value of Contract |
|---------------------|------------------------|--------------------------------------|----------------|-----------|-----------------|-----------|-----------------|--|--|------------------|------------|--------------------------|
| Product Development | SS/CPAF | Raytheon Systems, ST. PETERSBURG, FL | 381.781 | 4.510 | 3/99 | 0 | N/A | | | 386.291 | 386.291 | |
| | SS/CPAF | Raytheon Systems, ST. PETERSBURG, FL | 0 | 69.894 | 7/99 | 34.726 | 6/00 | | | CONT. | CONT. | |
| | SS/CPFF | JHU/APL LAUREL, MD | 154.622 | 19.058 | 8/99 | 17.500 | 6/00 | | | CONT. | CONT. | |
| | PD | NAVAIR PMA-231 PAX RIVER, MD | 83.200 | 37.680 | 6/99 | 11.600 | 5/00 | | | CONT. | CONT. | |
| | C/FFP | LOCKHEED AERO SYS, MARIETTA,GA | 40.512 | 0 | N/A | 0 | N/A | | | 0 | 40.512 | |
| | WR | NSWC,CRANE | 19.982 | 2.444 | 11/98 | 4.133 | 1/00 | | | CONT. | CONT. | |
| | WR | NSWC,DAHLGREN | 28.677 | 3.664 | 1/99 | 5.334 | 1/00 | | | CONT. | CONT. | |
| | WR | NSWC, PT HUENEME, CA | 34.396 | 6.052 | 4/99 | 5.333 | 5/00 | | | CONT. | CONT. | |
| | RC | NORFOLK NSY NORFOLK, VA | 3.753 | 0 | N/A | 0 | N/A | | | CONT. | CONT. | |
| | RC | SUPSHIP JACKSONVILLE, FL | 2.805 | 0 | N/A | 0 | N/A | | | CONT. | CONT. | |
| | RC | SUPSHIP PASC | 1.159 | 0 | N/A | 0 | N/A | | | CONT. | CONT. | |

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Exhibit R-3 Project Cost Analysis
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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E/4 | PROGRAM ELEMENT NAME AND NUMBER Cooperative Engagement Capability 0603658N | PROJECT NAME AND NUMBER CEC/K2039 |

| | Contract Method & Type | Performing Activity & Location | Total Pys Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | | | Cost To Complete | Total Cost | Target Value of Contract |
|----------|------------------------|--------------------------------|----------------|-----------|-----------------|-----------|-----------------|--|--|------------------|------------|--------------------------|
| | PD | DRPM, AEGIS WASHINGTON,DC | 115.245 | 0 | N/A | 0 | N/A | | | 0 | 115.245 | |
| | C/CPFF | NORTHROP/GRUMMAN, BETHPAGE NY | 9.295 | 0 | N/A | 0 | N/A | | | 0 | 9.295 | |
| | C/CPFF | LORAL CORP. EAGAN, MN | 5.075 | 0 | N/A | 0 | N/A | | | 0 | 5.075 | |
| | MIPR | AWACS SPO HANSCOM AFB, MA | 2.989 | 0 | N/A | 0 | N/A | | | 0 | 2.989 | |
| | WR | SPAWAR, SAN DIEGO, CA | 23.609 | .815 | 3/99 | 0 | N/A | | | 0 | 24.424 | |
| | C/CPFF | RAYTHEON, AEROSPACE ,CA | 21.761 | 3.162 | 5/99 | 0 | N/A | | | 0 | 24.923 | 25.220 |
| | C/CPIF | UNISYS, INC. ST. PAUL, MN | 24.630 | 0 | N/A | 0 | N/A | | | 0 | 24.630 | |
| | VAR | MISCELLANEOUS | 44.668 | 22.702 | 8/99 | 4.653 | 7/00 | | | CONT. | CONT. | |
| | TOTAL Product Dev | | 998.159 | 169.981 | N/A | 83.279 | N/A | | | CONT. | CONT. | |
| Remarks: | | | | | | | | | | | | |

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Exhibit R-3 Project Cost Analysis
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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY RDT&E/4 | PROGRAM ELEMENT NAME AND NUMBER Cooperative Engagement Capability 0603658N | PROJECT NAME AND NUMBER CEC/K2039 |

| | Contract Method & Type | Performing Activity & Location | Total Pys Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | | | Cost To Complete | Total Cost | Target Value of Contract |
|---------------------|------------------------|--------------------------------|----------------|-----------|-----------------|-----------|-----------------|--|--|------------------|------------|--------------------------|
| Test and Evaluation | VARIOUS | Miscellaneous | 16.478 | 15.615 | 7/99 | 28.800 | 8/00 | | | CONT. | CONT. | |
| STOTAL T&E | | | 16.478 | 15.615 | N/A | 28.800 | N/A | | | CONT. | CONT. | |
| Remarks: | | | | | | | | | | | | |
| Management | C/CPFF | Technautics | 7.671 | 1.554 | 6/99 | | N/A | | | 0 | 9.225 | |
| | VARIOUS | Miscellaneous | 14.267 | 8.312 | 8/99 | 2.852 | 2/00 | | | CONT. | CONT. | |
| STOTAL Mgmt. | | | 21.938 | 9.866 | N/A | 2.852 | N/A | | | CONT. | CONT. | |
| TOTAL | | | 1,036.575 | 195.462 | N/A | 114.931 | N/A | | | CONT. | CONT. | |
| Remarks: | | | | | | | | | | | | |

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Exhibit R-3 Project Cost Analysis
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